

# SUGAR BEETS

## PROBLEMS OF BEET CULTURE —DISEASES AND PESTS.

By Jesse H. Buffum.

The sugar beet, like most every other product of the soil, has its enemies, and while the root has made wonderful progress along lines of intrenchment and is fast becoming one of the leading products of agriculture in America, with this development have come the ravages of pests and the inroads of disease. While this is a result both natural and to be expected, it must be admitted for the encouragement of those concerned in this industry that the sugar beet has fewer enemies than the majority of crops, and we may be complacent in the knowledge that disease and infection have gained but little ground in the beet fields of the United States. This is due partly to the fact that we are so young as yet, but more perhaps may it be accounted for in the fact that wholesomeness has characterized the inception of the sugar beet industry in almost every locality. We are cautious about our seed, we are painstaking in the application of fertilizers in which, unlike most crop producers, the common barnyard manure, a marvelous vehicle of insects' eggs and bacteria, is eschewed so far as possible in practical culture.

But because the beet farmer has experienced little annoyance from attacks of pests and blights, he should not for one moment rest in contentment, believing himself immune from disturbances of this nature. Beet diseases and pests are bound to spread with the general expansion of the industry, and within a very few years the grower will find himself grappling with new problems in the shape of natural and physical enemies of his crop. Practical demonstrations have proven that methods of culture, care of the crop and manipulation of the soil may have much to do with maintaining a general condition unfavorable to the propagation of injurious bacteria and devastating insects, and wholly discouraging to the inroad and spread of diseases. In this matter as in many others that we have spoken of, the grower should assume an attitude of constant study, which will

capably fit him for intelligently dealing with these problems when they are finally presented in his own field, as is sooner or later pretty sure to be the case. In the case of some known diseases, curly top among them, exact remedies have not been discovered, but notwithstanding this, a knowledge on the grower's part of the habits of these affections will materially assist in whatever efforts to stamp out the trouble may be necessary later on. To this end a consideration of those diseases and pests that have already become known will be profitable to every grower, while the timeliness of the discussion must not be overlooked, as fall practices have much to do with the question in hand. First we will consider some of the lesser pests and then take up that most virulent of all beet enemies, curly top.

Grasshoppers may be said to be a prevalent enemy, though perhaps limited as to sections attacked. In cases they are found in the fields in sufficient numbers to damage the crop, and when found, steps should immediately be taken to get rid of them. There are two popular formulas for the destruction of these insects. Formula:

- 100 pounds of bran.
- 6 pounds of Paris green.
- 6 pounds common salt.
- 4 pounds sugar molasses.

Dissolve the molasses with salt added in water, and with this liquid moisten the bran. The Paris green should be mixed in separate vessel until it becomes a smooth paste; thin it with water, pouring this paste over the mash, mixing thoroughly. This should be used in the early morning on ditch banks along the edges of fields, sprinkling on vegetation and on the ground. Care must be taken not to give live stock and poultry access to this mixture, as the results might prove more interesting than helpful. Grasshoppers are not generally a distressing menace, but must be provided for in case they begin their ravages.

Continuing our study of insect pests, we find what is known as the "beet fly" (*Runkelsiege*), which for years has been considered the deadliest group of insect enemies of the

beet. The maggots of these flies undermine the beet leaves. They propagate very rapidly, frequently the second generation getting in its nefarious work in the same season as its parents. It is noted in those areas attacked that the middle of July, at least in foreign countries, finds a sudden cessation of their work. Professor Boeker of Germany has experimented extensively with these pests, and has improved recently upon the old method of fighting them. Formerly the only cure known was to strip off the infected leaves, in this way dealing with the maggots after incubation from the eggs. The Professor's new way is to set along the rows of beets slender strips of wood on which are tacked pieces of fly paper (he manufactured a special variety to facilitate the work, using stiff drawing paper covered with bird glue), and on these strips the flies themselves were caught, before their eggs had been laid. The experiment was very successful, 630 of the flies being caught in three days. The setting out of the strips of fly paper must begin with the first appearance of the leaves above ground. The strips may be so set as not to interfere with the operations of caring for the beets; and they should face toward the northeast that the sun may not dry them too rapidly. It must be added that frequent and thorough hoeing of the soil is one of the best methods of cure, or rather prevention, as it destroys the chrysalis lying dormant in the ground before hatching.

Cut worms have sometimes attacked the beets, as was the case in a Michigan instance, where worms of a smoky color and very large put in an appearance. The species at the time was not determined; but very successful efforts were made toward their destruction. Poisoned baits were made use of, bran being mixed with Paris green at the rate of two pounds of poison to one hundred of bran and moistened with cheap molasses and water. This was distributed about the edges of the afflicted patches. An effect was produced within twenty-four hours, and later it developed that the places treated with the bait escaped with practically no injury. Salt, if applied in doses of from 150 to 200 pounds per acre, will sometimes kill the young worms in their wanderings and deter the older ones. The farmer wants to know,

however, what effect constant sowings of salt is going to have on his soil before he engages in this practice very extensively.

There is a worm that has suddenly become abundant in certain Colorado beet fields, known as the Beet Web-Worm, which is freely attacking both beets and alfalfa. Prof. Gillette, who made a thorough investigation of the scourge, reports that in every case found, the worm was hatched in the alfalfa fields and migrated over into the beet fields. It is supposed that this worm appears every year to a minor degree in some of the Colorado beet fields. In one instance a five-acre tract was completely stripped of all its leaves. In consequence of this, Prof. Gillette strongly advises a careful watch of all beet fields adjoining alfalfa. At the first symptom of the worms crossing into the beets, spray or dust immediately a preparation of arsenate of lead, or Paris green, along the margin between the fields, and also it might be well to treat a narrow strip of the alfalfa nearest the beets. If dusting is resorted to, use Paris green, sifted through a cheesecloth, or spray one pound of the lead to every ten gallons of water. In case a Paris green spray is made use of, mix one pound of the powder to every fifty gallons of water. Again constant and thorough cultivation of the soil plays an important part, and will be a successful means of destroying the worms. These worms come from eggs deposited in the alfalfa fields by the little gray moths so frequently seen on lawns and about the blossoms of fruit trees.

The "Nematode" has attracted our attention in this country just a bit, and has done business in several places, and Utah and California are among these. This serious trouble seems to have come to us from Germany, where its ravages have been disastrous, but the worm has not gained in this country very fast. It is supposed that it came across the water in some shipments of seed. The government learned of its presence here and since then has been doing all in its power to stamp it out. The theory has been advanced that a sufficiency of lime on the soil will prove an admirable preventive.

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